

# 30-Day Launch Forecast

13 July 2000

Prepared By:

**ANSER**

John McMillan

(703) 416-3519

For:

HQ USAF/XOO

Maj Mark Roomsma

(703) 614-1221

Distribution

XOO:

AF/CC

AF/CV

AF/INXY

AF/TEP

AF/XO

AF/XOI

AF/XORR

AF/XOOOO (AFDO)

AF/XOOOOB

AF/XPPS

BMDO/TRT

DAMO-FDW

J-38/DSOD

J-38/NOD-NOB

J-5/POL

J-6S

NAIC/IA

NAIC/IAS

OSD/C3I

OSD/DDR&E

SAF

SAF/OSX

SAF/SX

SAF/SXP

497th IG/INOA

AQSL:

National Security

Space Architect

PEO SPACE

SAF/AQ

SAF/AQS

SAF/AQSD

SAF/AQSL

SAF/AQSM

SAF/AQSS

ANSER:

AFSPC/DOOL

BMDO

DOC/OASC

DOS/OES-STH

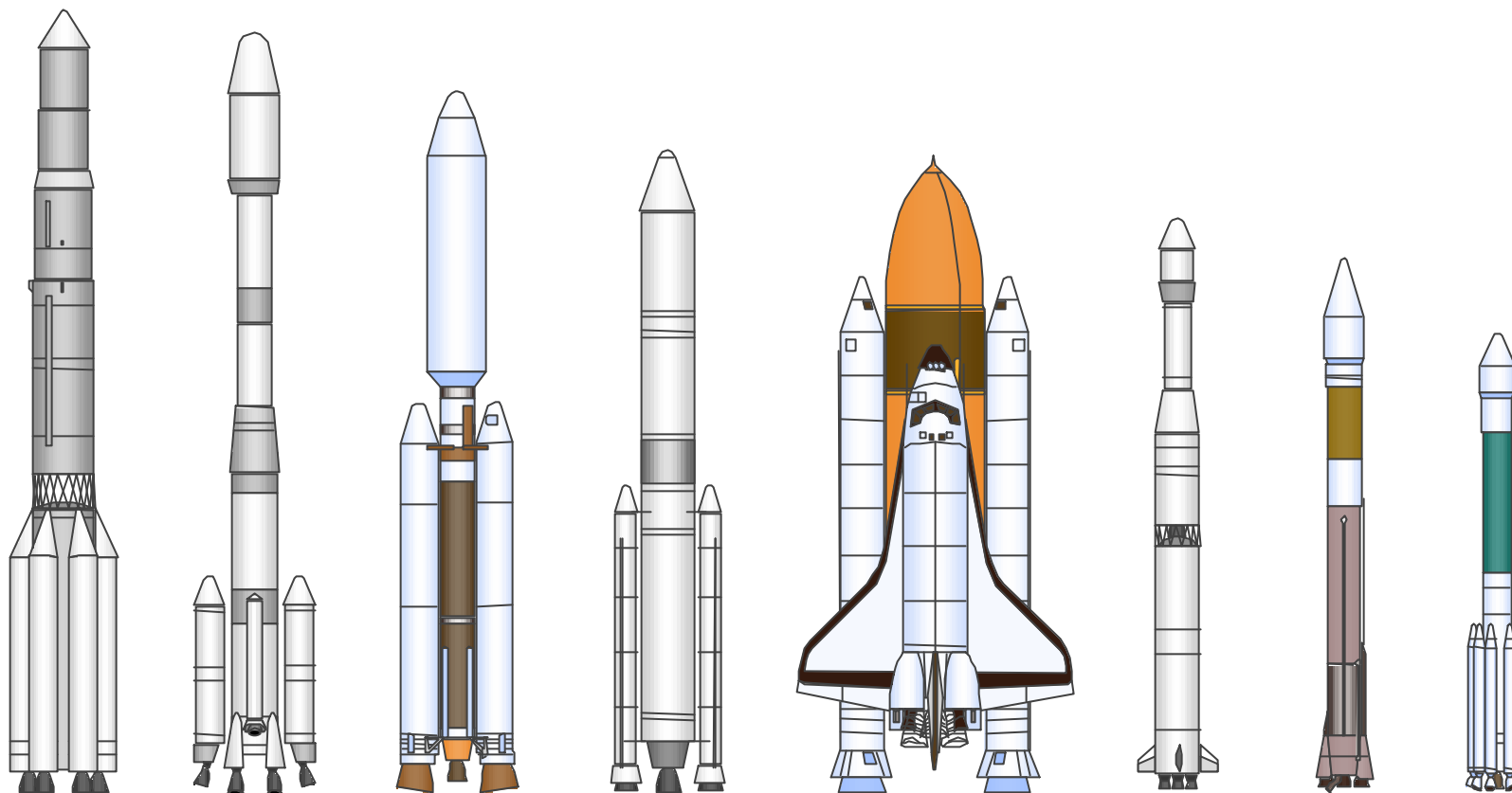
DOT/OCST

IPO

OSTP

SMC/TEL

USSPACECOM



ANSER Space Analysis Division

HQ USAF/XOO

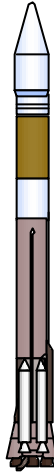
# 30-Day Launch Forecast (13 July 2000 - 11 August 2000)

Mon	Tue	Wed	Thu	Fri	Sat	Sun	Comments / Schedule Changes															
<b><u>A Look Ahead</u></b> 17 Aug Ariane 44LP Nilesat 102 23 Aug Delta 3 dummy 25 Aug Dnepr Saudisat 1-A & 1-B 29 Aug Titan 2 NOAA-L 08 Sep STS-106 ISS 2A.2b 21 Sep Soyuz-U Progress M1 24 Sep Zenit 2 Badr-2 All foreign launches presented in this forecast are unofficial			13  Atlas 2AS EchoStar-6 SLC-36B CCAFS 0121-0320 EDT	14  Kosmos 3M CHAMP MITA Plesetsk 0800 EDT	15  Soyuz-Fregat Cluster-2 Baikonur 0840 EDT	16  Delta 2 GPS IIR-5 SLC-17A CCAFS 0517-0543 EDT	Atlas 2AS / EchoStar-6 • 6th DBS satellite for the EchoStar Com. Corp. • System broadcasts for the Digital Sky Highway (DISH) Kosmos 3M / CHAMP / MITA • CHAMP: Challenging Mini-Satellite Payload for Geophysical Research and Application (German) • MITA: Mini-satellite Italiano a Tecnologia Avanzata (Italian)															
17	18	19  Minotaur MightySat II.1 CSLF VAFB 1609-1735 EDT	20	21	22	23	Soyuz-Fregat / Cluster-2 • First pair of four identically instrumented science satellites sponsored by ESA  Delta 2 (7925) / GPS IIR-5; Flight 279 • NAVSTAR Global Positioning System															
24	25  Ariane 5 Astra-2B/ GE-7 ELA-3 CSG TBD EDT	26	27  Sea Launch PAS-9 Launch Platform 1846 EDT	28	29	30	Minotaur / MightySat II.1 • Orbital/Suborbital Launch Vehicle • Air Force Research Laboratory (AFRL) multi-mission, small satellite program  Ariane 506 / Astra-2B / GE-7; Flight 130 • Astra-2B: SES of Luxemburg communications system • GE-7: GE Americom communications satellite															
31  Titan 4B NRO SLC-4E VAFB 2200-0200 EDT	1 Aug	2  Soyuz-U Progress M1 Baikonur TBD EDT	3	4	5	6	Sea Launch / PAS-9 • PanAmSat DTH communications satellite  Titan 4B / NRO; Mission B-28 • Classified military satellite • No Upper Stage (NUS/403 configuration)  Soyuz-U / Progress M1 • Resupply for ISS															
7	8	9  Soyuz-Fregat Cluster-2 Baikonur TBD EDT	10	11	Last Week's Launch Activities <table><tr><th>Date</th><th>Vehicle</th><th>Payload</th><th>Site</th><th>Type</th></tr><tr><td>08 Jul</td><td>Minuteman II</td><td>IFT-5</td><td>VAFB, LF-03</td><td>Missile Defense</td></tr><tr><td>12 Jul</td><td>Proton</td><td>Zvezda</td><td>Baikonur</td><td>ISS</td></tr></table>			Date	Vehicle	Payload	Site	Type	08 Jul	Minuteman II	IFT-5	VAFB, LF-03	Missile Defense	12 Jul	Proton	Zvezda	Baikonur	ISS
Date	Vehicle	Payload	Site	Type																		
08 Jul	Minuteman II	IFT-5	VAFB, LF-03	Missile Defense																		
12 Jul	Proton	Zvezda	Baikonur	ISS																		
Launch Date provided in Universal Time																						

Launch Date provided in Universal Time

Acronyms: VAFB - Vandenberg AFB CA CCAFS - Cape Canaveral AFS FL KSC - Kennedy Space Center FL CSLF - Calif. Space Launch Facility NET - No Earlier Than WFF - Wallops Flight Facility  
 SLC - Space Launch Complex LC - Launch Complex LF - Launch Facility EDT - Eastern Daylight Time EST - Eastern Standard Time CSG - Guiana Space Center

# Atlas 2AS



## Current Mission Specifics

302nd space launch of the Atlas vehicle

### Reliability History

- Atlas: 276 successes in 301 attempts
- Atlas 2 / 2A / 2AS: 48 successes in 48 attempts

### Typical Launch Sequence

- |                                   |           |
|-----------------------------------|-----------|
| • Ground-Lit SRB Ignition         | -0.5 sec  |
| • Booster Sustainer Ignition      | 0 sec     |
| • Booster Engine Cutoff           | 163 sec   |
| • Booster Package Jettison        | 166 sec   |
| • Payload Fairing Jettison        | 215 sec   |
| • Sustainer Engine Cutoff         | 289 sec   |
| • Atlas/Centaur Separation        | 293 sec   |
| • Centaur Main Engine Start (#1)  | 310 sec   |
| • Centaur Main Engine Cutoff (#1) | 585 sec   |
| • Centaur Main Engine Start (#2)  | 1,476 sec |
| • Centaur Main Engine Cutoff (#2) | 1,572 sec |
| • Spacecraft Separation           | 1,799 sec |

Payload weight: EchoStar-6; 7,941 lb (at launch)

Orbit: Geostationary, 110° West

Next Atlas 2 series (2A or 2AS) launch

- TBD / Atlas 2AS / ICO-A2

## Background Information

First Launch:	December 1993
Flight Rate:	4-6 per year
Launch Site:	SLC-36A & SLC-36B (CCAFS, USA); SLC-3E (VAFB, USA)
Capability:	18,980 lb to LEO (medium fairing); 8,450 lb to GTO

## History

- Started in 1950s as Air Force ICBM.
- Modified in 1960s for space launches.
- Cryogenic Centaur upper stage first launched in 1962.
- Atlas 2AS is an uprated version of the Atlas 2A.
- Four solid rocket motors added to form Atlas 2AS.

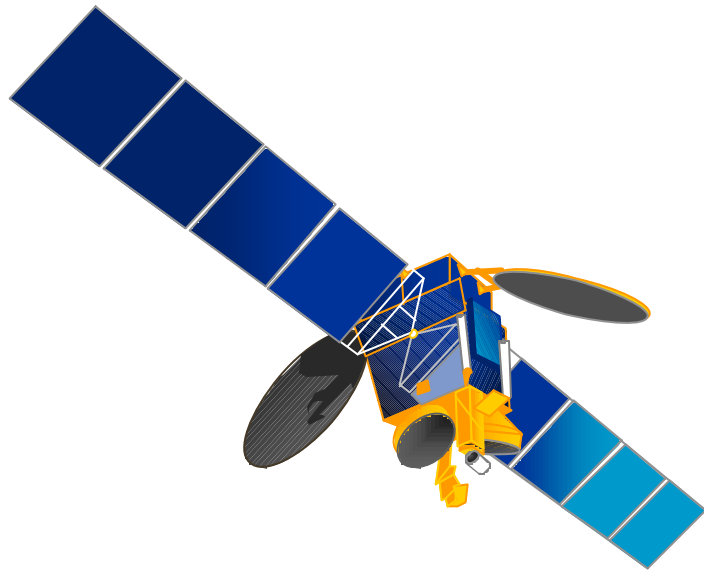
## Description

- Three and a half stage vehicle.
- Stage 1 consists of two Rocketdyne MA-5A booster engines plus one sustainer engine burning LOX/RP-1 fed from stage 1 tanks, generating a total of 485,775 lb of thrust.
- Stage 2 (Centaur) uses two Pratt & Whitney RL10A-4-1 engines (with an optional extendible nozzle) that burn LH<sub>2</sub>/LOX, generating 44,600 lb of thrust with Block I upgrade.
- Four Thiokol Castor IVA solid rocket motors burn HTPB, generating 97,560 lb of thrust each.

## Profile

Length:	156 ft	Launch Weight:	523,585 lb
Diameter:	10 ft	Liftoff Thrust:	680,895 lb
Payload Fairing:	34 x 11 ft (Medium); 40 x 13.8 ft (Long); 43 x 13.8 ft (Extended)		

# EchoStar-6



## Spacecraft Specifications

### Weight:

- 7,941 lb (at launch)

### Dimensions:

- Solar Arrays: 102.7 ft

## EchoStar-6

Sixth in a series of DBS communications satellites owned by EchoStar Communications Corporation.

## Mission

Provide video, audio and data services throughout the continental United States, Hawaii and Alaska via the Digital Sky Highway (DISH) Network.

## Description

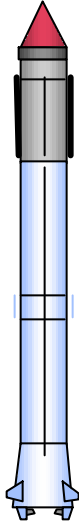
### Spacecraft Description:

- FS-1300 series bus; three-axis stabilized.
- 32 active 125 W TWTAs Ku-band beams; reconfigurable into 16 active 220 W transponders.
- Power: 10 kW (BOL); NiH<sub>2</sub> batteries for eclipse protection.
- Design life: 12 years.

Orbit: Geostationary, 110° West (co-located with EchoStar-5)

Prime Contractor: Space Systems/Loral

# Kosmos 3M



## Current Mission Specifics

431st space launch of the Kosmos vehicle

### Reliability History

- 412 successes in 430 attempts

### Typical Launch Sequence

- N/A

Payload Weight: CHAMP; 1,102 lb (at launch)  
MITA; N/A

Orbit: 254 nm circular, near-polar orbit, 83° inclination

### Next Kosmos launch

- TBD

## Background Information

First Launch: August 1964  
Flight Rate: 28 per year (maximum recorded launch rate)  
Launch Site: Plesetsk and Kapustin Yar, Russia  
Capability: 3,085 lb to LEO

## History

- Originated in 1950s as the SS-5 (Skean) ballistic missile.
- Developed into a launch vehicle by NPO Yuzhnoye (Ukraine).
- First used in 1964 for multiple launch of small satellites.
- Production transferred to AKO Polyot in Omsk, Russia.

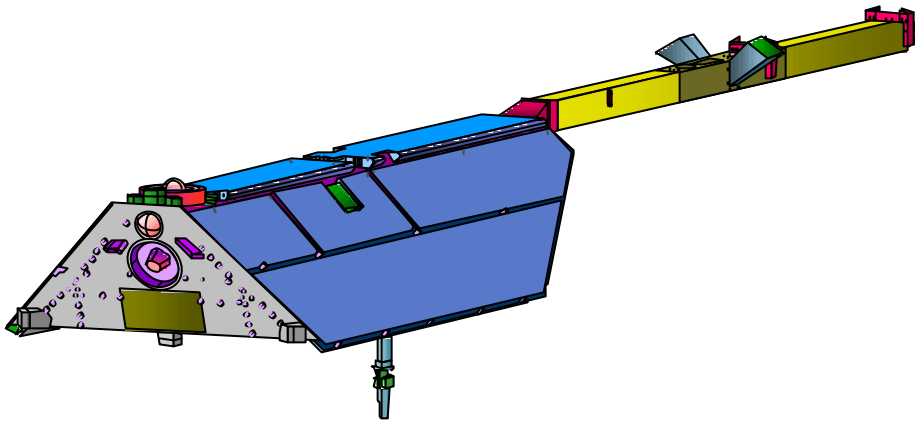
## Description

- Two-stage liquid-fueled vehicle.
- Stage 1 uses one RD-216 booster engine burning  $N_2O_4$ /UDMH propellant generating a total of 388,350 lb of thrust.
- Stage 2 KB Khimmach 11D49 engine burns  $N_2O_4$ /UDMH and produces 35,393 lb of thrust from main chamber. Four steering thrusters provide 405 lb of thrust each.
- Stage 2 has restart capability for orbit circularization.

## Profile

Length:	106.3 ft	Launch Weight:	240,300 lb
Diameter:	7.9 ft	Liftoff Thrust:	388,350 lb
Payload Fairing:	18.8 ft x 7.8 ft		

# CHAMP



## CHAMP

The German CHAMP (Challenging Mini-Satellite Payload for Geophysical Research and Application) satellite geomagnetic mission will investigate the Earth gravity field, the global Earth magnetic field, as well as the Earth's atmosphere / ionosphere. The mission leader and customer of the satellite is the GFZ GeoForschungsZentrum Potsdam.

## Mission

The purpose of the project is to develop an attitude control system for fine pointing with minimal consumption of the cold gas, which is vital for extension of the mission life-time.

## Description

### Spacecraft Description:

- 3 axis stabilized, trapezoid-shaped body, aligned to Earth.
- Equipped with three electromagnetic coils and cold gas-jets to provide control torque.
- Payload instruments: ONERA Accelerometer, Fluxgate and Overhauser Magnetometers, Star Sensors, Digital Ion Drift Meter, Laser Retro Reflector, GPS.
- Power: 6 m<sup>2</sup> of body-mounted solar generator surface produces 140 W; battery of NiH<sub>2</sub>-cells ensures the appropriate power supply during eclipses.
- Design life: Multi-year mission.

Orbit: 254 nm circular, near-polar orbit, 83° inclination

Prime Contractor: Jena-Optronik

## Spacecraft Specifications

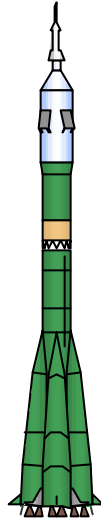
### Weight:

- 1,102 lb (at launch)

### Dimensions:

- Length: 14.3 ft
- Height: 5.4 ft
- Base: 3.3 ft
- Top: .98 ft
- Boom Length: 13.1 ft

# Soyuz-Fregat



## Current Mission Specifics

550th launch of a Soyuz Launch Vehicle since 1980

Reliability History (since 1980)

- 536 successes in 549 attempts

Typical Launch Sequence

- |                            |         |
|----------------------------|---------|
| • Lift off                 | 0 sec   |
| • Strap-ons separate       | 118 sec |
| • Payload fairing jettison | 160 sec |
| • Core stage 1 separation  | 286 sec |
| • Orbit Injection          | 540 sec |

Payload Weight: Cluster-2; 5,290 lb (total at launch)

Orbit: Highly eccentric polar orbits ranging from 13,510 to 67,555 nm at 64.8° - 90° inclination

Next Soyuz launch

- 2 August 2000 / Progress M1 (ISS)

## Background Information

First Launch:	November 1963
Flight Rate:	45 per year (maximum recorded launch rate)
Launch Site:	Plesetsk, Russia; Baikonur, Kazakhstan
Capability:	15,400 lb to LEO; 5,500 lb to 760 nm circular, 51.8° orbit (with Ikar)

## History

- Developed from the Vostok Launch Vehicle originally derived from the SS-6 (Sapwood) ICBM.
- Used to launch every former Soviet Union piloted spacecraft since 1964.
- Also used to launch photo reconnaissance satellites, earth resource satellites, and Progress resupply missions to the Mir space station.
- Starsem, a joint European/Russian venture, formed in 1996 to market Soyuz-Fregat, a commercial version of Soyuz.

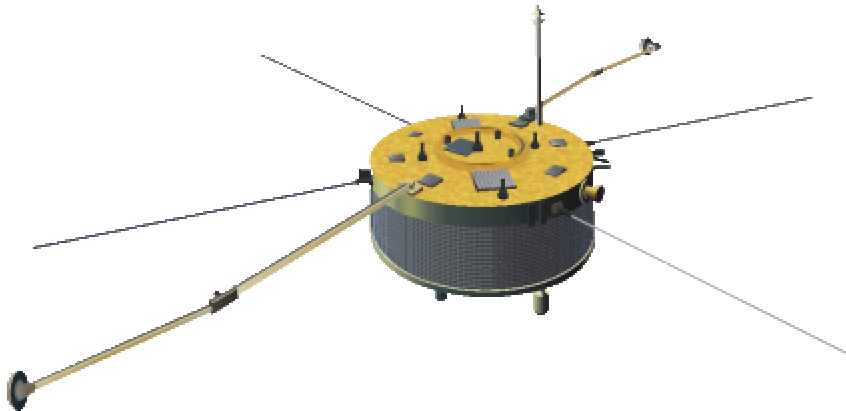
## Description

- Two-stage (plus 4 strap-ons) liquid fueled vehicle.
- Stage 1 core has one RD-108 booster engine (one turbopump with four separate combustion chambers) burning LOX/kerosene fed from stage 1 tanks, generating 220,050 lb of thrust.
- Four Stage 1 strap-ons each have one RD-107 engine (one turbopump with four separate combustion chambers) burning LOX/kerosene fed from stage 1 tank, generating a total of 227,925 lb of thrust each.
- Stage 2 has one RD-0110 Block 1 engine burning LOX/kerosene, generating 67,050 lb of thrust.
- Starsem version only: Fregat restartable upper stage powered by a single-chamber Lavochkin engine burning UDMH/N<sub>2</sub>O<sub>4</sub>, generating 4,410 lb of vacuum thrust.

## Profile

Length:	162.5 ft	Launch Weight:	682,765 lb
Diameter:	33.8 ft	Liftoff Thrust:	1,334,700 lb
Payload Fairing:	37.3 ft x 9.8 ft		

# Cluster II



## Spacecraft Specifications

### Weight:

- 2,645 lb (at launch)
- 1,213 lb (dry mass)

### Dimensions:

- Height: 4.3 ft
- Diameter: 9.5 ft

## Cluster II

First pair of four identical satellites that will fly in formation. Cluster II is one of ESA's top priority Cornerstone science missions, and replaces the original Cluster mission that was destroyed during the failed maiden launch of the Ariane 5 rocket in June 1996.

## Mission

Study the interaction between the the solar wind and the Earth's magnetosphere allowing for the first time truly three-dimensional measurements of both large- and small-scale phenomena in the near-Earth environment.

## Description

### Spacecraft Description:

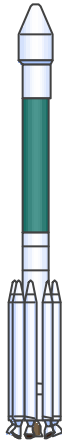
- Spin-stabilized cylindrical bus; orbit/attitude maintenance performed by semi-radial and axial control thrusters together with the main engine.
- Each satellite carries an identical set of 11 instruments mounted to the Main Equipment Platform.
- Power: 224 W provided by six curved solar-array panels; five 80 Ah Silver Cadmium batteries provide eclipse protection.
- Carries two 5 meter-long experiment booms, four 50 meter-long wire booms, and two antenna booms.
- Telemetry downlink bit rate 2 to 262 kbit/s.
- Design life: 2 years.

Orbit: Highly eccentric polar orbits ranging from 13,510 to 67,555 nm at 64.8° - 90° inclination

Prime Contractor: Dornier



# Delta 2



## Current Mission Specifics

279th launch of the Delta vehicle

### Reliability History

- Delta: 262 successes in 278 attempts
- Delta 2: 88 successes in 89 attempts

### Typical Launch Sequence

- |                                  |       |     |
|----------------------------------|-------|-----|
| • Stages 0 & 1 Ignition, Liftoff | 0     | sec |
| • Solid Boosters Jettison        | 63    | sec |
| • Solid Ignition (3 Solids)      | 66    | sec |
| • Solid Boosters Jettison        | 133   | sec |
| • Second Stage Ignition          | 278   | sec |
| • Fairing Jettison               | 302   | sec |
| • Third Stage Ignition           | 1,400 | sec |
| • Spacecraft Separation          | 1,700 | sec |

Payload Weight: GPS IIR-5; 4,480 lb (at launch)

Orbit: 10,898 nm circular, 55° inclination

### Next Delta 2 launch

- 17 October 2000 / Earth Observing-1

## Background Information

First Launch:	February 1989
Flight Rate:	6-12 per year
Launch Site:	SLC-17A & SLC-17B (CCAFS), SLC-2 (VAFB)
Capability:	11,110 lb to LEO (28.5°); 4,120 lb to GTO

## History

- Delta program initiated by NASA in 1959.
- Incorporated components from USAF's Thor and USN's Vanguard.
- First Delta vehicle launched in May 1960.
- Delta 2 is enhanced version of Delta 3920/PAM.

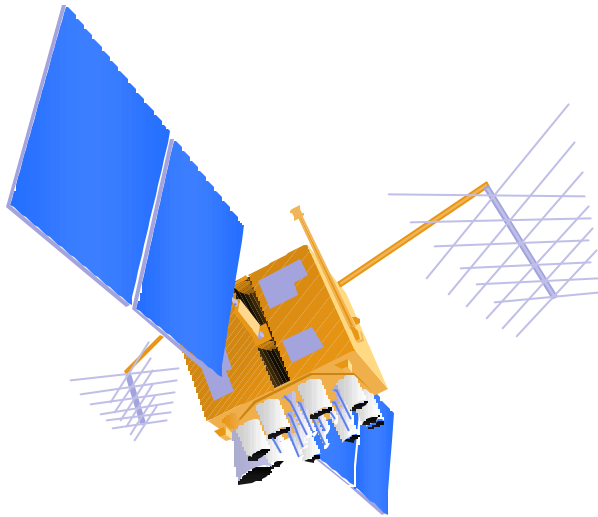
## Description

- Three-stage vehicle plus up to nine strap-on motors.
- Stage 0 consists of nine Alliant Techsystems Graphite Epoxy Motors (GEMs) providing 98,870 lb of thrust each (three are air lit).
- Stage 1 uses one Rocketdyne RS-27A engine that burns LOX/RP-1, generating 201,000 lb of thrust.
- Stage 2 uses one Aerojet ITIP engine that burns  $N_2O_4$ /A-50, generating 9,645 lb of thrust.
- Stage 3 (model 7925 only) uses one Thiokol Star 48B solid rocket motor that burns HTPB, generating 15,100 lb of thrust. Model 7920 has no 3rd stage.

## Profile

Length:	126.0 ft	Launch Weight:	511,180 lb
Diameter:	8.0 ft	Liftoff Thrust:	699,750 lb
Payload Fairings:	27.8 ft x 9.5 ft; 29.2 ft x 10.0 ft		

# GPS IIR-5



## Spacecraft Specifications

### Weight:

- 4,480 lb (at launch)
- 2,370 lb (BOL)

### Dimensions: (deployed)

- Main Body: 5.0 x 6.33 x 6.25 ft
- Solar Arrays: 144 ft<sup>2</sup>

## GPS IIR-5

5th of the Block IIR series Global Positioning Satellites. The GPS IIR program includes 21 satellites that will improve navigation accuracy and provide longer autonomous satellite operation than current GPS satellites.

## Mission

Provide highly accurate, worldwide navigational position and velocity for DoD and civilian users.

## Description

### Spacecraft Description:

- Six aluminum honeycomb panels mounted to central aluminum core.
- Zero momentum, 3-axis stabilized, Earth-oriented, Sun-nadir pointing.
- L-band subsystem: 20- to 50-Watt transmitter; 20 MHz bandwidth; 1575.42 MHz (L1), 1227.6 MHz (L2).
- Power: 1,136 W (EOL) provided by twin 2-panel Si solar wings; NiH<sub>2</sub> battery for eclipse protection.
- Design life: 10 years min.

Orbit: 10,898 nm circular, 55° inclination

Prime Contractor: Lockheed Martin Missiles & Space

# Orbital/Suborbital (Minotaur)



## Current Mission Specifics

2nd launch launch of the Minotaur Vehicle

### Reliability History

- 1 success in 1 attempt

### Typical Launch Sequence

- |  |         |
|--|---------|
| • Stage 1 ignition, Liftoff            | 0 sec   |
| • Stage 1 separation, stage 2 ignition | 61 sec  |
| • Fairing separation                   | 118 sec |
| • Stage 2 separation                   | 128 sec |
| • Stage 3 ignition                     | 127 sec |
| • Stage 3 burnout                      | 199 sec |
| • Stage 3 separation                   | 604 sec |
| • Stage 4 ignition                     | 615 sec |
| • Stage 4 burnout                      | 684 sec |
| • Payload separation                   | 744 sec |

Payload Weight: MightySat II.1; 275 lb (at launch)

Orbit: 150 to 400 nautical miles, all inclinations

### Next Minotaur Launch

- TBD

## Background Information

First Launch: January 2000

Flight Rate: 1-2 per year

Launch Sites: VAFB, USA and possibly Kodiak, Alaska

Capability: 780 lb to 400 x 400 sun-synchronous (1,482 lb to 100 nm, 28.5°)

## History

- Orbital Sciences Corporation selected by Air Force Space and Missile Systems Center in September 1997 to convert Minuteman II.
- Contract with Orbital Sciences Corporation worth \$206 million for up to 24 suborbital and orbital missions per year.
- U.S. government sponsored payloads only.
- Program Office, SMC-TEB Kirtland AFB.

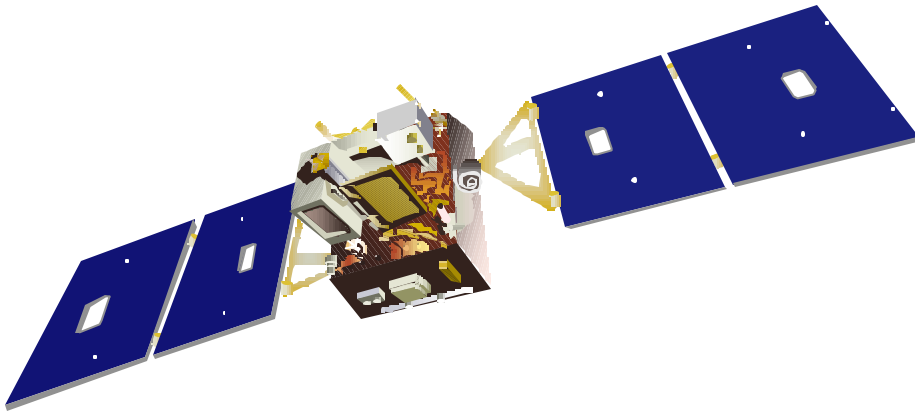
## Description

- Four-stage solid-propellant launch vehicle.
- Uses Minuteman II first and second stages and Pegasus upper stages.
- Stage 1 M-55 solid rocket motor generates 178,000 lb of thrust.
- Stage 2 SR-19 solid rocket motor generates 60,312 lb of thrust.
- Stage 3 Orion 50XL solid rocket motor generates 34,515 lb of thrust.
- Stage 4 Orion 38 solid rocket motor generates 7,435 lb of thrust

## Profile

Length:	63 ft	Launch Weight:	79,800 lb
Diameter:	5.5 ft	Liftoff Thrust:	178,000 lb
Payload Fairing:	50 inch (Standard); 61 inch (Optional)		

# MightySat II.1



## Spacecraft Specifications

### Weight:

- 275 lb (at launch)

### Dimensions:

- Main Body: 24 x 24 x 18 inches (stowed)

## MightySat II.1 (also called Sindri)

MightySat II is an Air Force Research Laboratory (AFRL) multi-mission, small satellite program that demonstrates on-orbit high-payoff space system technologies. The MightySat II series of two to five spacecraft will provide AFRL with a "lab bench" for responsively testing emerging technologies to ensure their readiness for operational Air Force missions.

## Mission

Provide the AFRL a tailorable, affordable method to rapidly demonstrate its emerging space technologies.

## Description

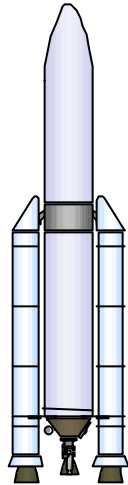
### Spacecraft Description:

- 3-axis stabilized Multi-functional Composite Bus Structure.
- Command & Data Handling: 380 Mbyte Solid State Storage; 20 Mbps Storage Rate.
- Communications via the Air Force Satellite Control Network (AFSCN); Uplink rate of 2 Kbps; Downlink rate of 1 Mbps.
- Payloads: Shape Memory Alloy Thermal Tailoring Experiment (SMATTE); Fourier Transform Hyperspectral Imager (FTHSI); Solar Array Flexible Interconnect (SAFI); Solar Array Concentrator (SAC), Naval Research Laboratory miniature Space Ground Link System Transponder (NSX); Quad C40 Experimental Processor (QC40).
- Power: 330 W (EOL) Si solar arrays; 28 V unregulated bus.
- Design life: 1 year.

Orbit: 150 to 400 nautical miles, all inclinations

Prime Contractor: Spectrum Astro, Inc.

# Ariane 5



## Current Mission Specifics

6th launch of the Ariane 5 vehicle (506)

### Reliability History

- Ariane 5: 4 successes in 5 attempts

### Typical Launch Sequence

- |  |      |     |
|--|------|-----|
| • Ignition of stage 1 Vulcain engine     | 0    | sec |
| • Ignition of solid boosters and liftoff | 3    | sec |
| • Maximum dynamic pressure               | 71   | sec |
| • Maximum longitudinal acceleration      | 103  | sec |
| • Solid booster separation               | 126  | sec |
| • Payload fairing jettison               | 184  | sec |
| • Stage 1 separation                     | 592  | sec |
| • Payload separation                     | 1390 | sec |

Payload Weight: Astra-2B; 7,308 lb (at launch)  
GE-7; 4,266 lb (at launch)

Orbit: Geostationary, 28.2° (Astra-2B) East; 146° West (GE-7) inclination

### Next Ariane 5 launch

- September 2000 / N-Sat 110 / B-Sat 2A

## Background Information

First Launch:	June 1996 (Launch Failure)
Flight Rate:	Up to 10 per year
Launch Site:	ELA-3 (Kourou, French Guiana)
Capability:	39,680 to LEO; 22,045 lb to Sun-synchronous; 14,990 lb (single payload) to GTO; 13,160 lb (dual payload) to GTO

## History

- European Space Agency (ESA) began Ariane 5 development in 1988.
- ESA approves Ariane 5 Evolution program in October 1995.
- ELA-3 launch facility completed in Kourou, French Guiana in 1995.
- Two primary goals of Ariane 5 program are to improve reliability and to lower cost.

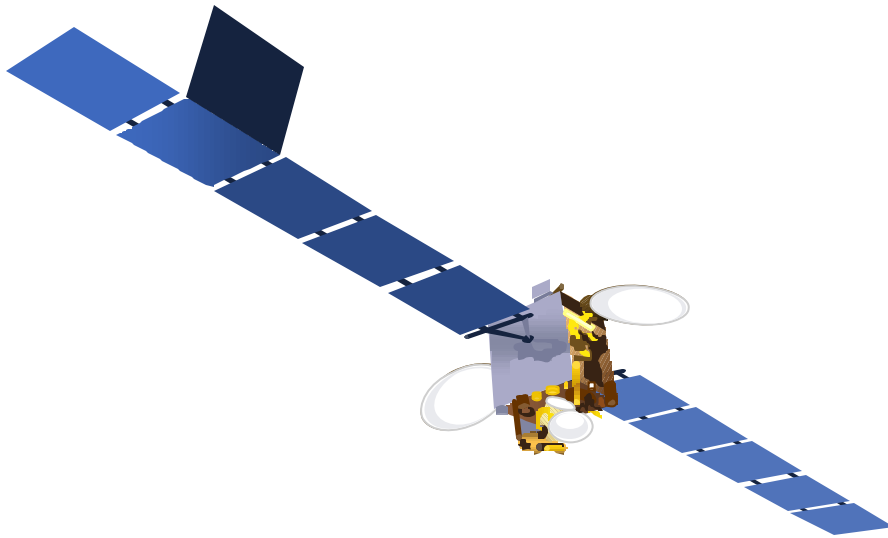
## Description

- Two-stage vehicle with two strap-on solid boosters.
- Stage 1 burns  $\text{LH}_2/\text{LOX}$  in one Vulcain HM-60 engine generating an average thrust of 202,500 lb at launch.
- Stage 2 burns  $\text{N}_2\text{O}_4/\text{MMH}$  in one Aestus L9 engine generating 6,190 lb of thrust.
- Two three-segment solid strap-on boosters (EAP) burn HTPB generating 1,181,250 lb of thrust each.
- The thrust profile of the solid boosters is tailored to reduce thrust during maximum dynamic pressure so that the Vulcain HM-60 is not required to throttle.
- The upper composite section includes the single second-stage engine, an electrical equipment bay, a SPELTRA or SYLDA 5 bearing structure for one, two, or three satellites, and the fairing.

## Profile

Length:	168.5 ft	Launch Weight:	1,644,630 lb
Diameter:	17.7 ft	Liftoff Thrust:	2,560,000 lb
Payload Fairings:	41.7 ft x 17.7 ft (Short); 55.8 x 17.7 ft (Long)		

# Astra-2B



## Spacecraft Specifications

### Weight:

- 7,308 lb (at launch)
- 3,329 lb (dry mass)

### Dimensions:

- Main Body: 5.6 x 8.2 x 9.2 ft
- Solar Arrays: 106 ft

## Astra-2B

Société Européenne des Satellites (SES) is the Luxembourg-based operator of the ASTRA satellite system. Astra-2B will be added to the SES's current fleet of nine satellites.

## Mission

Provide direct-to-home (DTH) transmission of TV, radio and multimedia in Europe.

## Description

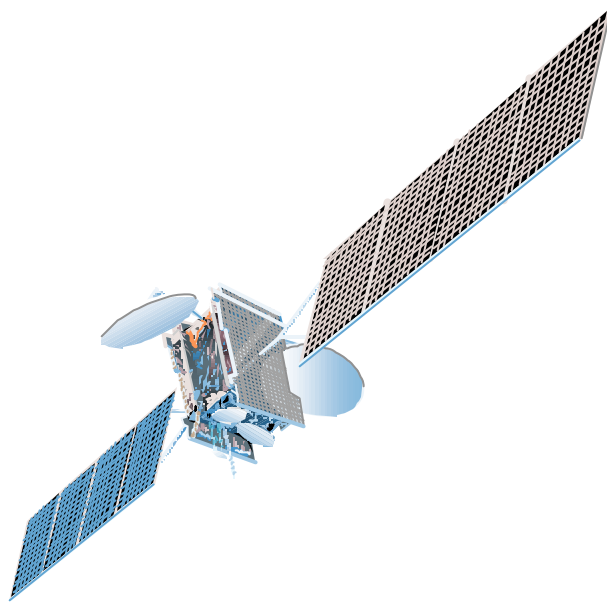
### Spacecraft Description:

- 3-axis Eurostar 2000+ platform.
- 30 (28 after 5 years) 108 W TWTA 11.7-12.5 GHz Ku-band European beams, 26/33 MHz FSS/BSS bandwidths, EIRP 52 dBW.
- Power: 7.8 kW (BOL).
- Design life: 15 years.

Orbit: Geosynchronous, 28.2° East

Prime Contractor: Astrium (formerly Matra Marconi Space)

# GE-7



## Spacecraft Specifications

### Weight:

- 4,266 lb (at launch)
- 2,011 lb (dry mass)

### Dimensions:

- Main Body: 13.5 x 11.8 ft
- Solar Arrays: 47.6 ft

## GE-7

GE Americom is a global provider of satellite communications services. GE-7 will be added to the company's current fleet of satellites serving North America and South America. It will eventually replace the Satcom C-1 satellite currently residing at 137° West Longitude.

## Mission

While GE-7 is expected to serve primarily as an in-orbit spare, the spacecraft will also provide both analog and digital video services and distribute cable programming to the fifty-state CONUS, Canadian and Caribbean regions.

## Description

### Spacecraft Description:

- 3-axis stabilized Lockheed Martin A2100(A) bus.
- 24 x 36 MHz 20 W SSPA C-band transponders, 5.900-6.425/3.7-4.2 GHz up/down frequency, EIRP 40 dBW.
- Power: 3.3 kW (BOL).
- Design life: 15 years.

Orbit: Geostationary, 146° West (initial)

Prime Contractor: Lockheed Martin Commercial Space Systems

# Space Launch Activities

## 2000 Year To Date

### United States Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
18 Jan	Minuteman II	IFT-4	VAFB, LF-03	Missile Defense (MIL)
21 Jan	Atlas 2A	DSCS-B8	CCAFS, SLC-36A	Communications (MIL)
27 Jan	Minotaur	JAWSAT	VAFB, SLC-7	Technology Demo (MIL)
03 Feb	Atlas 2AS	Hispasat 1-C	CCAFS, SLC-36B	Communications (COM)
08 Feb	Delta 2	Globalstar-14	CCAFS, SLC-17B	Communications (COM)
11 Feb	STS-99	SRTM	KSC, LC-39A	Radar Mapping (CIV)
08 Mar	Peacekeeper	GT-29-PA	VAFB, LF-05	FOT&E (MIL)
12 Mar	Taurus	MTI	VAFB, 576-E	Technology Demo (MIL)
12 Mar*	Sea Launch	ICO F-1	Pacific Ocean	Communications (COM)
25 Mar	Delta 2	IMAGE	VAFB, SLC-2W	Science (CIV)
03 May	Atlas 2A	GOES-L	CCAFS, SLC-36A	Meteorology (CIV)
08 May	Titan 4B	DSP-20	CCAFS, SLC-40	Early Warning (MIL)
11 May	Delta 2	GPS IIR-4	CCAFS, SLC-17A	Navigation (MIL)
19 May	STS-101	ISS 2A.2a	KSC, LC-39A	ISS Resupply (CIV)
24 May	Minuteman III	FTM-02	VAFB, LF-09	Flight Test Missile (MIL)
24 May	Atlas 3A	Eutelsat-W4	CCAFS, SLC-36B	Communications (COM)
07 Jun	Pegasus XL	TSX-5	VAFB	Science (MIL)
09 Jun	Minuteman III	GT-172-GM	VAFB, LF-10	FOT&E (MIL)
30 Jun	Atlas 2A	TDRS-H	CCAFS, SLC-36A	Communications (CIV)
08 Jul	Minuteman II	IFT-5	VAFB, LF-03	Missile Defense (MIL)

### French Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
25 Jan	Ariane 42L	Galaxy-10R	CSG, ELA-2	Communications (COM)
18 Feb	Ariane 44LP	SUPERBIRD-4	CSG, ELA-2	Communications (COM)
21 Mar	Ariane 505	INSAT-3B/ AsiaStar	CSG, ELA-3	Communications (COM)
19 Apr	Ariane 42L	Galaxy 4-R	CSG, ELA-2	Communications (COM)

### Chinese Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
25 Jan	LM 3A	Zhongxing-22	Xichang	Communications (CIV)
25 Jun	LM 3	Fengyun-2B	Xichang	Meteorological (CIV)

### Indian Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
No Launches to Date				

### Japanese Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
10 Feb*	M-5	ASTRO-E	Kagoshima	Science (CIV)

### Brazilian Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
No Launches to Date				

\* Indicates Launch Failure  
Launch Date provided in Universal Time



# Space Launch Activities

## 2000 Year To Date

### Russian Launches

<u>Date</u>	<u>Vehicle</u>	<u>Payload</u>	<u>Site</u>	<u>Type</u>
01 Feb	Soyuz-U	Progress M1-1	Baikonur	Mir Resupply (CIV)
03 Feb	Zenit 2	Cosmos 2369	Baikonur	Signal Intelligence (MIL)
08 Feb	Soyuz-Fregat	IRDT	Baikonur	Technology Demo (COM)
12 Feb	Proton	Garuda-1	Baikonur	Communications (COM)
12 Mar	Proton	Express-6A	Baikonur	Communications (CIV)
20 Mar	Soyuz-Fregat	Dumsat	Baikonur	Technology Demo (COM)
04 Apr	Soyuz-U	Soyuz TM-30	Baikonur	Mir Resupply (CIV)
17 Apr	Proton	SESat	Baikonur	Communications (COM)
25 Apr	Soyuz-U	Progress M1-2	Baikonur	Mir Resupply (CIV)
03 May	Soyuz-U	Cosmos 2370	Baikonur	Classified (MIL)
16 May	Eurockot	SIMSAT-1 & -2	Plesetsk	Demo Flight (COM)
06 Jun	Proton	Gorizont-45	Baikonur	Communications (CIV)
24 Jun	Proton	Express-3A	Baikonur	Communications (CIV)
28 Jun	Kosmos 3M	Nadezhda/ Tsinghua-1/ SNAP-1	Plesetsk	Navigation (CIV) Remote Sensing (CIV) Technology Demo (CIV)
30 Jun	Proton	Sirius-1	Baikonur	Communications (COM)
04 Jul	Proton	Geyser	Baikonur	Data Relay (MIL)
12 Jul	Proton	Zvezda	Baikonur	ISS (CIV)

### Launch Market Analysis

#### By Country

	<u># of Launches</u>	<u>Percent of Market</u>
US	10	30.3%
Russia	16	48.5%
France	4	12.1%
China	2	6.3%
Japan	1	3.0%

#### By Mission

	<u># of Launches</u>	<u>Percent of Market</u>
US Military	3	9.1%
US Civil	3	9.1%
US Commercial	4	12.1%
World Military	3	9.1%
World Civil	10	30.3%
World Commercial	10	30.3%

#### By Orbit Type (Commercial Only)

<u>GEO</u>	<u># of Launches</u>	<u>Percent of Market</u>
US	2	25.0%
Russia	2	25.0%
France	4	50.0%
China	0	0.0%
Japan	0	0.0%

<u>LEO</u>	<u># of Launches</u>	<u>Percent of Market</u>
US	2	33.3%
Russia	4	66.7%
France	0	0.0%
China	0	0.0%
Japan	0	0.0%

Figures Do Not Include US Space Shuttle, Small Launch Vehicles, or ICBM launches

\* Indicates Launch Failure  
Launch Date provided in Universal Time

ã ANSER Space Analysis Division

HQ USAF/XOO